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Appendix III.

[Vide answer to unstarred question No. 228 asked by Sri K. Krishna Rao at the meeting of the Legislative Assembly held on 29th July 1953, page 1652 supra.]

(*a*) With reference to the exploitation of lignite in South Arcot district and the starting of an iron and steel industry in this State, the following foreign firms and experts were consulted between 1st April 1948 and 31st March 1952 :—

(1) Messrs. Elektrokemisk A/S, Oslo, Norway,

(2) (*a*) Professor J. A. S. Ritson, D.S.O., M. INST. M.M.,

(*b*) Dr. G. W. Himus, Royal School of Mines, London,

(3) J. C. Mitcheson, Esq., B.SC., M.I., MIN., E.F.G.S.M. INST. F., Consulting Mining Engineer, Staffordshire, England,

(4) A. H. Ayers, Chief Engineer, Uttah Construction Company, San Francisco,

(5) D. J. Bleifuss, Vice-President and Chief Engineer, International Engineering Company, San Francisco (for H. W. Morrison of Morrison Knudson Inc.),

(6) Mr. Robert Foot of Messrs. Powell Duffryn, Technical Services, Limited, England,

(7) Messrs. Lurgi Company of Germany,

(8) Major H. M. Kudspeth, Millcraft, Horam, Sussex,

(9) Mr. William Conroy, President, Carey Baxter and Kennedy Inc., New York,

(10) Mr. Robert Stillson Sanford of the U.S. Bureau of Mines,

(11) Messrs. The American Cynamid Company, New York and

(12) The United States Bureau of Mines.

The experts and institutions mentioned in Nos. (8), (9) and (11) expressed their inability to give an advice. The reports from Nos. (7) and (12) have not yet been received. A summary of the reports received from the remaining firms and experts is furnished below :—

(1) *Messrs. Elektrokemisk A/S, Oslo, Norway.*—The raw materials investigated (lignite and iron ores) are all, after suitable pre-treatment, high grade raw materials for production of pig iron in the Tysland-Hole furnaces.

The lignite must be carbonized before charging into the electric pig iron furnace.

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The ores I and II, from Sandur, will give an excellent high quality electric pig iron suitable as well for high quality steel as for standard commercial steel production.

The ores, A, B and C from the Salem district, must be concentrated. There can be obtained a concentrate with a high content of iron, which will be a suitable raw material for electric pig iron production. Which methods should be preferred for conversion to steel must be based on further concentration, investigations and examination of the P-content of the concentrate.

(2) *Professor J. A. S. Ritson, D.S.O. M. Inst. M.M. Royal School of Mines, London.*—The project if undertaken will necessitate heavy initial expenditure and, in addition, will be a gamble. The adverse factors are the waterlogged ground and the looseness of the ground overlying lignite and the ratio of overburden to coal. If Government think it worthwhile continuing the scheme, he is prepared to depute a member of his staff for inspection on certain terms.

Dr. G. W. Himus.—The test conducted on the South Arcot lignite revealed that the ash content is very low. If the mineral could be mined, it might make a reasonable fuel even though the proportion of volatiles to fixed carbon is on the high side. The yield of montan wax is very low.

(3) *J. C. Mitcheson, Esq., B.S.C., M.I. Min., E.F.G.S.M. Inst. F., Consulting Mining Engineer, Staffordshire, England.*—The most favourable development of the area may prove to be by open cast rather than by underground mining but more information is required for arriving at a definite decision. He has not got sufficient experience of earthmoving operations and is willing to work as consultant on certain terms. He also wants to call in a Civil Engineer to assist him in coming to a decision.

(4) *A. H. Ayers, Chief Engineer, Uttah Construction Company, San Francisco.*—The project does not appear feasible for being undertaken at any reasonable cost by Government in view of the heavy overburden and the occurrence of artesian water above and below lignite. The clayey material both above and below lignite would appear to predict unstable slopes. He, however, suggests the drilling of a number of large diameter test wells down to and through the lignite bed and the installation of a vertical shaft deep well pump in each well and pumping continued until a record is secured of the amount of water taken out from the surface area and its effect on the ground water plan.

(5) *D. J. Bleifuss, Vice-President and Chief Engineer, International Engineering Company, San Francisco (for H. W. Morrison of Morrison Knudson Inc.).*—The company has extensive experience in open-pit mining and has executed several projects. It has investigated and submitted preliminary reports on various projects such as Rampadasagar Dam, Bhakra Dam, etc., in India

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and several projects in Turkey, Iran, etc. The company is prepared to depute three men (one Geologist, one experienced in open-pit mining and one experienced in ground-water problem) to visit the lignite area and furnish a technical report for a fee of $25,000.

(6) *Mr. Robert Foot of Messrs. Powell Duffryn, Technical Services, Limited, London.*—The lignite deposit may well provide the basis of a very considerable industrial enterprise and full benefit of the lignite can be obtained only by carrying out a sufficiently large scale co-ordinated plan covering not only the working of the lignite itself but its processing perhaps by briquetting, its conversion into power and possibly also by using it as the basis for such further commercial process as the extraction of waxes and the production of chemical and synthetic liquid fuels. He considers that it should be possible to exploit the lignite by open-cast working at a cost favourably comparable with the cost of production in the Bengal Coal Field. Deep mining is also possible at a cost comparable with that obtaining in Bengal but somewhat higher than for open-cast mining. Though he is confident that the question of water need not form an insoluble problem, he still feels that it is not possible to give any exact opinion without a thorough examination of the site and without undertaking any special investigation that may appear necessary. He proposes to send a small team consisting of a Senior and a Junior Mining Engineer and specialists. This team will stay in India for a period of two months. On its return, the team will work out a preliminary and co-ordinated scheme covering all aspects of the problem in two or three months. The expenditure in the above proposal is estimated at £9,000 exclusive of travel, subsistence and other out of pocket expenses.

(7) *Mr. R. S. Sanford of the U.S. Bureau of Mines.*—Stripping the overburden, pumping the water and mining the lignite and clays will constitute a difficult engineering problem. The services of a mining engineer experienced in large scale open-cut mining would be required. The ground-water problem should be further investigated by additional drilling shaft sinking and open-cut excavation on a pilot plant scale as a means of estimating the volume of water to be pumped from the projected open-cut mine and that the hydrographic study of the area should be completed early. In order to determine the engineering feasibility and economic desirability of open-cut mining of lignite, a committee of four engineers should be appointed and the Committee after gathering all the engineering and economic data should jointly submit their findings and conclusions to the Government.

(*b*) The fees paid to the firms and experts for the tests conducted by them are as follows :—

(1) Messrs. Elektrokemisk A/S, Oslo, Norway—£100 sterling.

(2) Messrs. Lurgi Company, Germany—£250 sterling.

(3) Dr. G. W. Himus of the Royal School of Mines—100 guineas.